

**TBD02 – (Part 02) Proteins**

Name \_\_\_\_\_

1. B.2.1 Draw the general formula of 2-amino acids. (1)
  - a. How many amino acids are there? Draw the general structure of all amino acids (functional as R):
  
  
  
  
  
  - b. There are 10 essential and 10 non-essential proteins, explain how this affects complete and incomplete proteins:
  
2. B.2.2 Describe the characteristic properties of 2-amino acids (2) *Properties should include isoelectric point, formation of a zwitterion and buffer action.*
  - a. What is meant by the formation of a zwitterion?
  
  
  
  
  
  - b. What is meant by the buffer action of a protein?
  
  
  
  
  
  - c. What is meant by the isoelectric point?
  
3. B.2.3 Describe the condensation reaction of 2-amino acids to form polypeptides. (2) *Reactions involving up to three amino acids will be assessed.*
  - a. Show the condensation of any three amino acids
  
  
  
  
  
  
  
  
  
  
  - b. What type of bond is formed between two amino acids? \_\_\_\_\_
  
  
  
  
  
  - c. Explain the orientation of polypeptide chains (what at the ends called, how are they oriented?):
  
  
  
  
  
  - d. In terms of the ends, why does the order of amino acids make a difference?

4. B.2.4 Describe and explain the primary, secondary ('-helix and (-pleated sheets), tertiary and quaternary structure of proteins. (3) *Include all bonds and interactions (both intramolecular and intermolecular) responsible for the protein structure.*

a. Describe the structure of each, provide structures (drawings) and explanations

	Structure, explanation, bonding, etc
<b>Primary</b>	
<b>Secondary</b>	What part of the peptide chain is responsible for secondary features? _____
<b>Tertiary</b>	What part of the peptide chain is responsible for tertiary features? _____
<b>Quaternary</b>	

5. B.2.5 Explain how proteins can be analysed by chromatography and electrophoresis. (3)

a. There are two methods of analysing proteins, describe each below:

	Explanation	Draw the set up or result
<b>Chromatograph</b>		
<b>Electrophoresis</b>		

6. B.2.6 List the major functions of proteins in the body. (1) *Include structural proteins (for example, collagen), enzymes, hormones (for example, insulin), immunoproteins (antibodies), transport proteins (for example, hemoglobin) and as an energy source.*

- What is the difference between structural and functional proteins? What type of tertiary structure (globular, fibrous) are associated with each?
- List how proteins are crucial components for basic life processes:
- What is the immunoprotein function?
- What is the hormone function?